Requested Patent: GB1127043A

Title: SECURITY PAPERS ;

Abstracted Patent: GB1127043 ;

Publication Date: 1968-09-11 ;

Inventor(s): ;

Applicant(s): PORTALS LTD;; ALAN JOHN TOOTH;; JOHN ANTHONY THORP ;

Application Number: GB19660003992 19660128 ;

Priority Number(s): DE19671696245 19670126 ;

IPC Classification: ;

Equivalents: DE1696245, FR1509551 ;

ABSTRACT:

1,127,043. Ferromagnetic coatings. POR- TALS Ltd., A. J. TOOTH and J. A. THORP. 24 Jan., 1967 [28 Jan., 1966], No. 3992/66. Heading B2E. [Also in Division D2] A base sheet of Cellophane (Registered Trade Mark), glass, alginate, plastics material, silk, cotton or natural or synthetic paper is coated with ferromagnetic material by dipping, vacuum deposition or electrodeposition. The magnetic coating may be powdered magnetic iron oxide in a carrier such as sodium car- boxymethyl cellulose or cellulose acetate solu- tions. An unspecified adhesive may be used too. The magnetic coating may be discon- tinuous, or as bands of different unspecified ferromagnetic materials with differing mag- netic properties, the bands being deposited successively on the base, or the magnetic coat- ing may be printed as a design or letters. The coating and base may be subsequently coated on both sides with opaque white pigmented ink.

PATENT SPECIFICATION
NO DRAWINGS

1,127,043

1,127,043

Date of filing Complete Specification: 24 Jan., 1967.
Application Date: 28 Jan., 1966. No. 3992/66.
Complete Specification Published: 11 Sept., 1968.

Index at acceptance: —D2 B(11B, 13J1, 17); B2 E(1A, 1C, 1H)
Int. Cl.: —D 21 h 5/10

COMPLETE SPECIFICATION

Security Papers

We, PORTALS LIMITED, a British Company, of Laverstoke Mills, Whitchucrh, Hampshire, ALAN JOHN TOOTH, a British Subject, and JOHN ANTHONY THORP, a British Subject, both of Portals Limited, Laverstoke Mills, Whitchurch, Hampshire, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to security papers; for example, papers for banknotes and cheques.

It is known that security papers may be rendered distinguishable from counterfeits by including alien materials in various forms within the body of the paper. These inclusions are introduced during manufacture of the paper and may be made from a wide range of materials and in various shapes. For example, the inclusion may take the form of a continuous thread, or ribbon, of Cellophane film metallised with an aluminium layer or, alternatively, of P.V.C. film or films of other plastics similarly treated. In other cases, the inclusion may be in the form of planchettes of metal, plastics or paper, or assemblies thereof. Alternatively, fibres, differing in colour or nature from the fibres constituting the base paper, may be included.

The purpose of these known devices is to provide security papers with features which may be readily detected and recognised by an unskilled observer and being of such a nature as to cause a would-be counterfeiter to undertake difficult, tedious and expensive manufacturing operations in order to imitate or reproduce the visual effects thereof.

According to the present invention there is provided a method of making security paper which method includes the step of incorporating within the paper during its production from papermaking fibres, as a security device, a thread, planchette, or fibre which includes or consists of a ferromagnetic material, the quantity of ferromagnetic material incorporated as the thread planchette or fibre being sufficient to render the magnetic properties of the ferromagnetic material detectable in a security document made from the security paper. The invention further provides security paper when made by this method, and also security documents such as banknotes or cheques whenever made from such security papers.

The threads, planchettes or fibres may be manufactured from a ferromagnetic material or manufactured from a non-ferromagnetic base material provided with a coating of ferromagnetic material.

In the case of security devices made from solid ferromagnetic materials comprising metals, ceramics or plastics materials with a ferromagnetic material filler, a foil of the magnetic material may be produced and then sub-divided into threads or planchettes. Fibres may be produced from the said magnetic materials by any known convenient method of producing fibre-like particles of solid material such as shaving, skiving, turning, extrusion, blowing, cutting, growing whiskers or deposition.

In the case of security devices made from materials with magnetic coatings, for example, Cellophane, glass, alginate, plastics, natural or synthetic papers or other thin materials, sheets or webs of these materials may be coated with ferromagnetic material by dipping, vacuum deposition, electro deposition or other known processes, with or without an adhesive, and thereafter sub-divided into magnetic threads, planchettes or fibres. In all of these methods of manufacture, the magnetic coating may comprise any convenient medium having the required covering and adhesive properties and loaded with magnetic oxide of iron, or other powdered ferromagnetic material.

[Price 4s. 6d.]

The security devices according to the present invention are intended for incorporation into security papers during manufacture by the techniques commonly employed in the security paper manufacturing industry. For example, a magnetic thread may be unwound from a bobbin into a cylinder mould papermaking machine, or similar machine of known type, so that it is incorporated into a central layer of the paper in course of manufacture, preferably within a section of the paper containing a watermark of characteristic form. Alternatively, fibre-like pieces of magnetic material, or fibres of some material such as silk or cotton coated with magnetic material, may be mixed with the stock suspension fed to the papermaking machine so that the special fibres are randomly distributed amongst the normal papermaking fibres forming the security paper. Or, preferably, the special fibres may be introduced as a dilute suspension in water to a cylinder mould papermaking machine, or similar machine of known type, along with an appropriate suspension of papermaking fibres in such a way that they only appear in designated bands within the security paper.

The detection of the magnetic properties of the security devices introduced into security papers in accordance with the method of the present invention may be carried out for example by detectors which depend upon magnetic properties such as permeability, retentivity, hysteresis loss and coercivity, or the frequency or directional dependence of any such properties. As an example, the detection may be carried out by arranging for the magnetic device to complete a magnetic circuit energised by a permanent magnet or a coil fed with AC or DC current and in which the magnetic flux linking the circuit operates an indicator through a moving iron armature, Hall effect probe, search coil or other known system. Alternatively, the detector may first magnetise the device at one station and then detect this signal at another.

The security devices, in particular threads, may also be given discontinuous magnetic coatings, for example, by using printing techniques, so that the thread or other device exhibits discontinuous magnetic properties along its length either as it is scanned along its length or as it is monitored by a suitable array of detecting elements. Thus signals from the detector may be verified by a suitable logic system. Security threads or other devices of this type may also be manufactured by coating onto a sheet or web of base material bands of different ferromagnetic materials exhibiting differing magnetic properties, the coatings being made in successive operations performed in registration with each other by known means, the coated sheet or web then being sub-divided into security threads or other devices containing bands of differing magnetic properties arranged in a prescribed pattern.

Alternatively, the security thread or planchette may be endowed with magnetic coating material printed in the form of a design, lettering or pattern comprising minute characters as disclosed in our Complete Specification No. 1095286 dated the 8th July, 1963. It is envisaged that embodiments of this kind might conveniently be detected visually using known devices for viewing magnetised coatings preferably in co-operation with suitable means for optical magnification.

As an example of the manufacture and detection of a security paper containing a magnetic thread, a magnetic security thread, preferably formed from either a foil of uniformly magnetic material or a ribbon of suitable base film coated with a layer of material exhibiting uniform magnetic properties, was inserted into paper during manufacture on a cylinder mould machine, in such a position that the thread lay within a section of the paper containing a watermark of some prescribed and characteristic form. By this means, the magnetic material of the thread was covered, above and below, by a layer of fibres which varied in thickness and density along the length of the thread. Security documents cut from paper made by this method and tested with sensitive detection equipment of a suitable kind, preferably wherein the magnetising and detecting elements are small and lie in contact with the surface of the paper, generated output voltages or currents which varied in magnitude in accordance with the prescribed watermark pattern. It was thus possible to readily detect counterfeits. Alternatively, such a security document would be verified by two detecting systems placed one on each side of the paper whose outputs are applied to a suitable logic circuit via a differential network.

Following is a description by way of example of methods of making security papers in accordance with the invention.

Example 1

A magnetic coating mix was compounded from the following materials.

1 gm. Sodium carboxymethyl cellulose (Cellofas B3500 grade).
100 gm. Water.
20 gm. Magnetic oxide of iron (fine powder).

The sodium carboxymethyl cellulose was firstly dissolved in the water and the iron oxide then blended in to give a smooth, brushable paste.

A well beaten paper of 40 gm. was brush coated with this mixture and air dried. This material was then slit into strips 0.75 mm. wide which were laid into the centre of the section of a paper web during manufacture of the web.

Magnetic coatings of this type may also be given to other fibrous materials. For example, base strands of material such as silk, cotton or synthetics (such as nylon, Terylene (R.T.M.) or glass) may be drawn through a bath of the above described magnetic coating mix, and then dried and cut into convenient lengths. Alternatively, any known techniques of deposition may be used.

EXAMPLE 2

A continuous length of cellulose film, previously slit to a width of 0.5 mm. was run through a coating apparatus where it was contacted by an applicator roller. The periphery of this roller was serrated, so that lands of teeth of 1/16th inch width were spaced at ¼ inch intervals along its circumference.

A magnetic coating mixture consisting of iron oxide suspended in a cellulose acetate solution was applied only to the high lands of the applicator roller by a contacting roller fed from a reservoir.

The 0.5 mm. cellulose film or "thread" with discontinuous magnetic coating was then dried and wound on a bobbin from from which it was fed into a cylinder papermaking machine in such a way that it was incorporated in the centre of the section of the paper web.

The presence of the discontinuous magnetic material within the paper was readily demonstrated visually, using a known device for viewing magnetic tape.

EXAMPLE 3

A web of cellulose film was discontinuously coated or printed with a similar ink to that of Example 1 and was subsequently slit into "thread" of 0.5 mm. width. This thread was used and detected as in Example 1.

EXAMPLE 4

A magnetic security thread similar to Example 1 was subsequently coated on both surfaces with opaque white pigmented ink so that the magnetic material was not readily visible. This thread was detectable in the usual way.

The present invention as specifically exemplified above provides security devices which, without necessarily diminishing the visual value of devices of the hitherto known types also provide a physical property which is not determinable by visual observation but which may be readily detected with suitable equipment. By this means, doubtful banknotes or other security documents (which may be very soiled or dirty and therefore not easily verified visually) may be readily authenticated by non-destructive tests. The difficulties of a would-be counterfeiter are increased since he must now imitate both the visual and physical properties of the security device. A further advantage of the present invention as specifically described above is that, during production and processing of security documents the physical properties of the security device may readily be used for the automatic control of machinery for cutting, batching, counting and similar processes.

It is to be understood that the present invention is not limited to the specific details disclosed above. For example, magnetic security devices may be used whose magnetic properties are given directionality. For example a magnetic coating medium may be subjected during drying to an external magnetic field whose orientation or direction (relative to the surface of the device) may vary and thus produce permanent directional characteristics in the magnetic coating.

Also any suitable paper making machine may be used.

The words "Cellophane" and "Cellofas" used hereinbefore are registered Trade Marks.

WHAT WE CLAIM IS:—

1. A method of making security paper which method includes the step of incorporating within the paper during its production from papermaking fibres, as a security device, a thread, planchette or fibre which includes or consists of a ferromagnetic material, the quantity of ferromagnetic material incorporated as the thread planchette or fibre being sufficient to render the magnetic properties of the ferromagnetic material detectable in a security document made from the security paper.

2. A method as claimed in claim 1 wherein the thread, planchette or fibre is made by subdividing a foil comprising a metal, a ceramic, or a plastics material with a ferromagnetic material filler.

3. A method as claimed in claim 1 wherein the ferromagnetic material is in the form of a thread, planchette, or fibre manufactured from a non-ferromagnetic base material provided with a coating of ferromagnetic material.

4. A method as claimed in claim 3, wherein the ferromagnetic material is coated onto a sheet or web of base material which is subsequently subdivided into threads, planchettes or fibres, before incorporation within the paper.

5. A method as claimed in claim 3 or claim 4 wherein the thread is given a discontinuous coating of ferromagnetic material so that it exhibits discontinuous magnetic properties along its length.

6. A method as claimed in claim 5 wherein bands of different ferromagnetic materials exhibiting differing magnetic properties are coated onto a sheet or web of base material such that the threads, planchettes or fibres produced each having a coating containing bands of differing magnetic properties.

7. A method as claimed in claim 4 wherein the thread or planchette is provided with a coating of ferromagnetic material by printing the coating onto the sheet or web of base

material in the form of a design, lettering or pattern.

8. A method as claimed in any one of the preceding claims wherein the ferromagnetic material is a thread which is inserted into the paper in such a position that the thread lies within a section of the paper containing a watermark of characteristic form.

9. A method as claimed in any one of claims 1 to 4, or claim 6 wherein the ferromagnetic material is in the form of fibres and is introduced as a dilute suspension in water to a paper making machine along with an appropriate suspension of paper making fibres in such a way that the ferromagnetic fibres only appear in designated bands within the security paper.

10. A method as claimed in claim 1 and substantially as hereinbefore described specifically.

11. A method as claimed in claim 1 and substantially as hereinbefore described with reference to any one of the specific Examples.

12. A method as claimed in claim 1 and substantially as hereinbefore described with reference to Example 1.

13. Security paper when made by a method as claimed in any one of the preceding claims.

14. Security documents such as a banknote or cheque made by applying a design to a security paper as claimed in claim 13.

BOULT, WADE & TENNANT,
111 & 112, Hatton Garden, London, E.C.1.
Chartered Patent Agents,
Agents for the Applicant(s).

Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1968.
Published by the Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies may be obtained.